Summary of Fishery Surveys
Bass Lake (west of Park Falls), Price County, 2016-2017

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in fall 2016 and spring 2017 to assess the status of important fish populations in Bass Lake. Fall electrofishing surveys evaluated the first-summer survival and growth of naturally-produced walleye and muskellunge and complemented our information on panfish. We scratched fall fyke netting as our traditional assessment of black crappie population status because crappies were absent in all netting and electrofishing samples from Bass Lake in 2007-2008 and 1992. Fyke nets deployed when 85-95% of the ice cover had thawed targeted northern pike, walleye, muskellunge, yellow perch, and white suckers. A late-spring electrofishing survey documented the abundance and size structure of largemouth bass, smallmouth bass, and bluegill populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is our own description applied to bluegill ≥ 7 inches long, based on known angler behavior.

Survey Effort

On October 6, 2016 with water temperature 64-65°F we dip-netted all gamefish and panfish in an electrofishing circuit of the entire shoreline (1.58 miles) in 0.72 hour. On April 4, 2017 we set three fyke nets at locations chosen to intercept early spring spawning species. We added a fourth net on the following day after lingering ice receded from the south end of the lake. We tended our nets daily in lifts 1-4 and on alternate days in lifts 5 and 6 for 31 net-nights of survey effort. Water temperature ranged 40-43°F over the 8-day survey. Comparing measured water temperature with the optimal spawning temperature range of the targeted species, spring fyke netting was well timed to represent population status of northern pike, walleye, and yellow perch, but probably not muskellunge, which typically spawn when water temperature is 50-55°F. With nighttime water temperatures at 72-73°F our June 12th electrofishing survey should have coincided with the height of largemouth bass, smallmouth bass, and bluegill spawning activities. We again sampled the entire 1.81-mile shoreline in 0.80 hour, including 0.50 mile sub-sampled for all species in 0.25 hour.

Habitat Characteristics

Bass Lake is an 84-acre drained lake (having an outlet, but no inlet) located about eight miles west of Park Falls, WI. It is the second largest of five Price County lakes with the same name. Its unique waterbody identification code is 2279800. The average depth is 16 feet, and maximum depth is 46 feet. The water is clear (Secchi depth = 10 feet) and the substrate is 15% sand, 30% gravel, 50% rock, 5% muck, supporting a low density of submergent and emergent vegetation. An unnamed stream discharges about one cubic foot per second from the northwest corner to Hay Creek, a Class 2 trout stream. The

surrounding shoreland is 40% marsh and 60% upland. A shallow public boat landing is located on the north shore off Bass Lake Drive. Launching boats from trailers can be difficult.

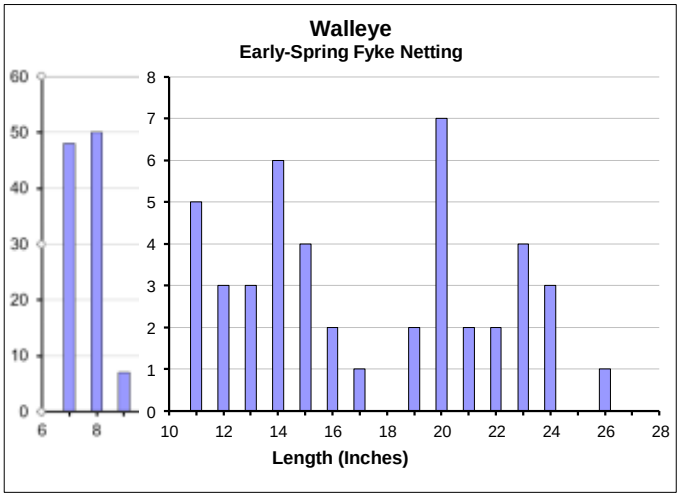
Summary of Results

We captured 14 fish species in our most recent fyke netting and electrofishing surveys. Species richness was near the 12 species found in 2007-2008. Again, the fish community's dominant predator was walleye, and the most common panfish was bluegill. Black crappies were absent in all contemporary samples, just as they were in the 2007-2008 and 1992 surveys. Early spring 2017 fyke nets captured one 34.9-inch northern pike and two brook trout 7½ and 8 inches long, and all recent samples included largemouth bass—three species not encountered in 2007-2008. Spring nets also captured 16.8 white suckers per net-night, just over twice the catch rate of spring 2008 nets. Though we measured none, most suckers were 9-12 inches long. Abundant suckers and common shiners undoubtedly represent the bulk of the forage base, as yellow perch were relatively scarce.

Walleye

Early Spring Fyke Nets

Captured 2.1 per net-night ≥ 10"	
Quality Size ≥ 15"	62%
Preferred Size ≥ 20"	42%
Memorable Size ≥ 25"	2%



Our capture rate of walleye 10 inches and longer in early spring 2017 fyke nets decreased by 63%, compared to spring 2008 netting. However, the length distribution now has a full range of size and age classes, including the small- and intermediate-size walleyes that we did not find in our spring 2008 netting sample. After a 16-year hiatus, WDNR resumed walleye stocking at rates of 35 small fingerlings (1-3″) per acre in 2009, 2010, and 2012 and 10 large fingerlings (6-8″) per acre in 2014 and 2016. The favorable size distribution suggests that stocking supplies the population with much-needed new recruits that were added far too slowly by natural reproduction alone. We did not evaluate the relative contributions from natural recruitment and stocking, though the length distribution suggests that at least some natural reproduction occurred in 1993-2008.

Using the Schnabel method, we estimated that walleye population density was 0.8 adults per acre (n = 68; $CI_{95\%}$ = 40-113; SD = 18.0; CV = 0.27), based on the ratio of fin-clipped to newly-captured fish in six successive fyke net lifts. Walleye density of about one adult per acre is typical of populations in the ceded territory maintained primarily through stocking. At low density, adult walleye populations typically have higher-than-average shares of preferred- and memorable-size fish, as we found in our early spring fyke nets.

Illustrations by Virgil Beck

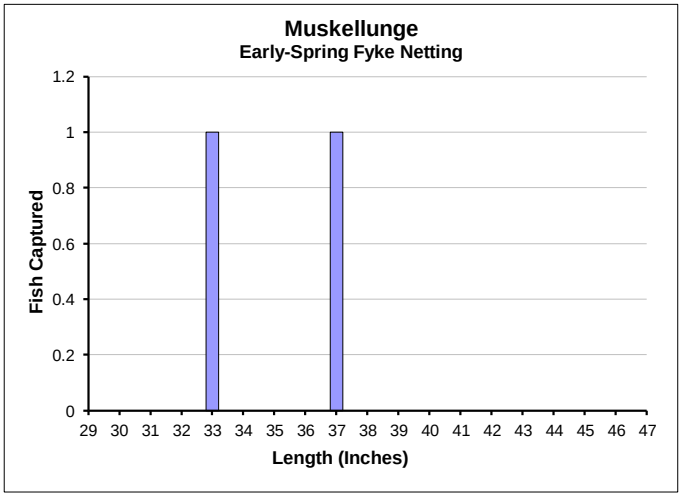
Assuming all walleyes < 10 inches long in spring nets had hatchery origin, we estimated by the same method that 44% of 843 walleye fingerlings survived since they were stocked on October 24, 2016 (range 27-70%; n = 371; $CI_{95\%}$ = 231-594). Our comparison also revealed that after 166 winter days at large, the age-1 walleyes in our sample had grown 0.6 inch from their 7.5-inch average length at stocking.

Currently, anglers may keep three walleyes of any length per day, but the existing harvest regulation may not be the best fit for the population, if recruitment relies heavily on continued stocking. Because walleyes in Bass Lake were once shown to grow very slowly and/or contain elevated levels of mercury in their edible flesh, walleye harvest has had no minimum length limit since 1994, when the exemption was granted under Chapter NR 20.35 Wisconsin Administrative Code. Our next surveys in Bass Lake are scheduled in 2025 and 2026. In the interim, however, lethal sampling of nine walleyes 12 – 22+ inches long for age and contaminant analysis could help us decide if the conditions that gave rise to the size limit exemption persist. If we find that the condition(s) that led to this exemption no longer exist, then we should follow the procedures in NR 20.35 to replace the size limit exemption with the standard harvest regulation for walleye in Wisconsin's Ceded Territory. Anglers could then keep a daily bag limit of 3 walleyes from 15 to 20 inches, with one over 24 inches, and young walleyes would be protected until they attain quality size.

Muskellunge

Early Spring Fyke Nets

Captured 0.1 per net-night ≥ 20"	
Quality Size ≥ 30"	100%
Preferred Size ≥ 38"	0%
Memorable Size ≥ 42"	0%



Early spring 2017 fyke nets captured two male muskellunge 33.6 and 37.4 inches long, whose gender and length gain could possibly correlate them with the only muskies captured in our 2007-2008 surveys (two males 29.1 and 34.2 inches in spring nets). Late spring electrofishing yielded a 32.2-inch musky whose gender was unknown. All muskies received a passive integrated transponder (PIT) tag injected into their cheek. If we catch these fish again, an electronic scanner will activate the PIT tag and display a unique identification code, allowing us to track the survival and growth of individual fish. With no musky stocking since 1989, we can assume that natural reproduction maintains the population at low abundance, unless the last-stocked fingerlings survived 28 years or longer. With plentiful forage and a history of low abundance, we are somewhat surprised that Bass Lake does not have more muskies or larger muskies. Perhaps small lake size limits population density and size structure. We recommend no management changes and we expect no changes in population status under Northern Zone harvest regulations.

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Northern Pike

Early Spring Fyke Nets

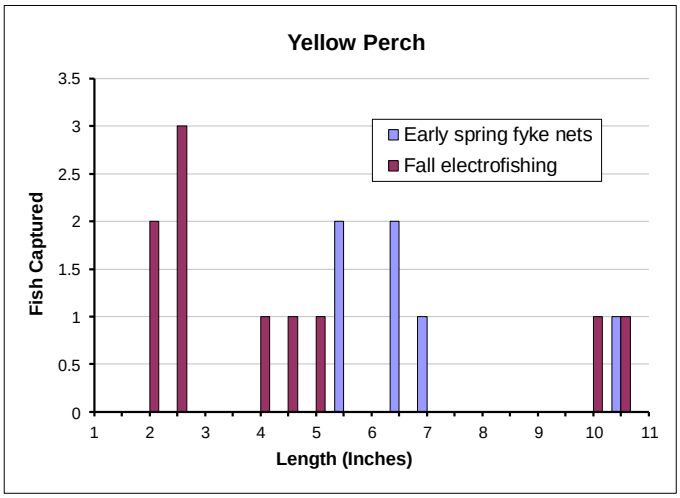
Captured 0.03 per net-night ≥ 14"	
Quality Size ≥ 21"	100%
Preferred Size ≥ 28"	100%
Memorable Size ≥ 34"	100%

We found only two records of northern pike in Bass Lake surveys completed since 1961: a 34.9-inch female and a 26-inch pike of unknown gender aged from scales at 7 years old, both captured in early spring fyke nets in 2017 and 1992. Transient pike from the Flambeau River may occasionally enter Bass Lake via Pine Creek and Hay Creek, but our well-timed netting survey detected no resident population.

Yellow Perch

Early Spring Fyke Nets

Captured 0.3 per net-night ≥ 5"	
Quality Size ≥ 8"	17%
Preferred Size ≥ 10"	17%
Memorable Size ≥ 12"	0%

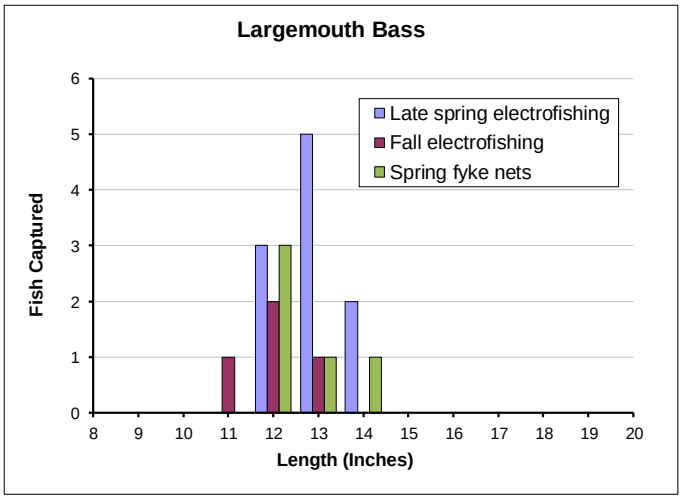


Early spring 2008 fyke nets captured yellow perch at 14 times the rate of spring 2017 nets, perhaps due to the difference in sampling effort (6 versus 31 net-nights, respectively). The catch rate and length distribution in spring nets represent very low population abundance with poor size structure. However, the preferred-size perch caught by spring netting and fall electrofishing offer at least some perch angling opportunity that we did not find in our 2007-2008 samples. Nonetheless, perch in Bass Lake will continue to be more important as forage, rather than as dinner for panfish anglers.

Largemouth Bass

Late Spring Electrofishing

Captured 5.5 per mile or 13 per hour ≥ 8"	
Quality Size ≥ 12"	100%
Legal Size ≥ 14"	20%
Preferred Size ≥ 15"	0%



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Largemouth bass were absent in our 2007-2008 samples, but they were captured in all previous electrofishing surveys except in late April 1985. Late spring 2017 electrofishing captured largemouth bass at a slow rate, suggesting low population abundance. Fall 2016 electrofishing captured 2.5 largemouth bass per mile (5.6 bass per hour), and spring 2017 nets captured five more, though bass were non-targeted bycatch in both those surveys. In all 2016-2017 samples combined, largemouth bass outnumbered smallmouth bass by six to one. Nearly 16% of largemouth bass in that aggregate sample were legal size, but none attained preferred size ≥ 15 inches long. Most avid bass anglers would probably be disappointed with the slow fishing action and the slim prospects for catching large fish that our samples foreshadow.

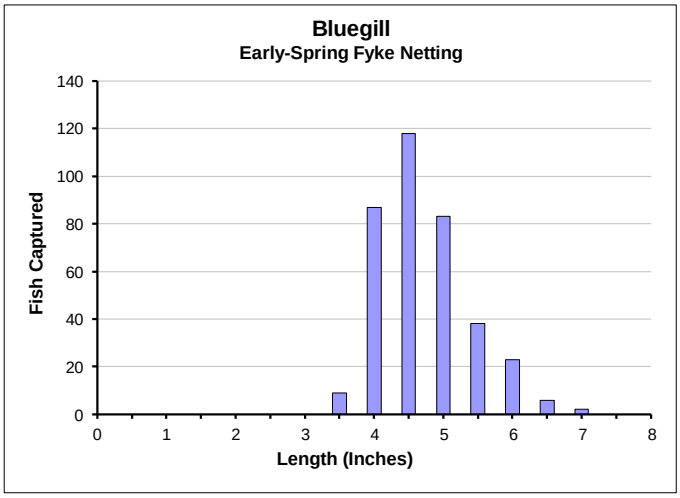
Smallmouth Bass

We turned up no smallmouth bass when we targeted both black bass species by late spring electrofishing, but our incidental catches included two smallmouth bass 15.8 and 15.9 inches long taken by fall electrofishing and a 19.2-inch smallmouth in spring nets. Despite Bass Lake's low conductivity that may have reduced our electrofishing capture efficiency, all measures again reflect the low smallmouth bass population abundance that we found in our 2007 and 2008 surveys.

Bluegill

Early Spring Fyke Nets

Captured 30 per net-night ≥ 3"	
Quality Size ≥ 6"	8%
Keeper Size ≥ 7"	0.5%
Preferred Size ≥ 8"	0%



All three surveys portrayed a bluegill population in moderate abundance whose length distribution included very low proportions of quality- and keeper-size fish. Recent spring samples showed higher bluegill abundance than much smaller samples indicated in spring 2008, but bluegill size structure was similar and disappointing in both periods. Nearly identical spring and fall electrofishing capture rates did not suggest that bluegill abundance was exceptionally high in 2016-2017. However, if low nutrient levels are limiting food production in this clearwater, mesotrophic lake, even a moderate number of bluegills may be competing among themselves for food in short supply. If intense food competition has impaired their growth rate, few bluegills will live long enough to reach keeper and preferred sizes. We

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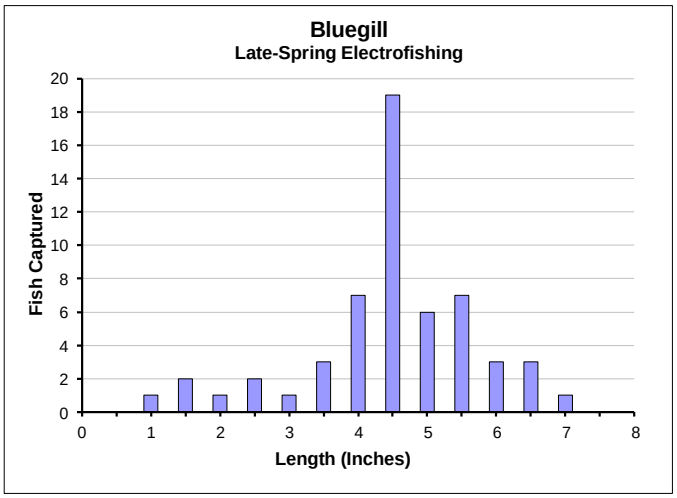
hope that stocked walleyes will eat many young bluegills to help curb bluegill numbers. However, given the food choices available to them in Bass Lake, walleyes, pike, muskies, and bass will likely choose to eat the easy-to-swallow, tube-shaped suckers, shiners, and perch, rather than the platter-shaped bluegills. Like our last prediction, we foresee little or no improvement to bluegill size in this infertile ecosystem.

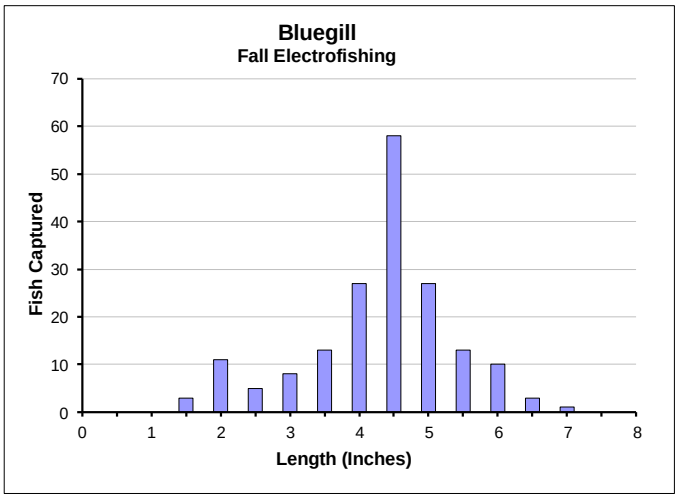
Late Spring Electrofishing

Captured 100 per mile or 200 per hour ≥ 3"	
Quality Size ≥ 6"	14%
Keeper Size ≥ 7"	2%
Preferred Size ≥ 8"	0%



Fall Electrofishing

Captured 101 per mile or 222 per hour ≥ 3"	
Quality Size ≥ 6"	9%
Keeper Size ≥ 7"	0.6%
Preferred Size ≥ 8"	0%



Survey data collected and analyzed by: Matt Anchor, Chad Leanna, Kendal Patrie, Evan Sniadajewski, and Jeff Scheirer—WDNR Fishery Team, Park Falls.

Written by: Jeff Scheirer—Fishery Biologist, February 8, 2018.

Reviewed and approved for web posting by: Mike Vogelsang—Northern Administrative District Supervisor, July 15, 2019.

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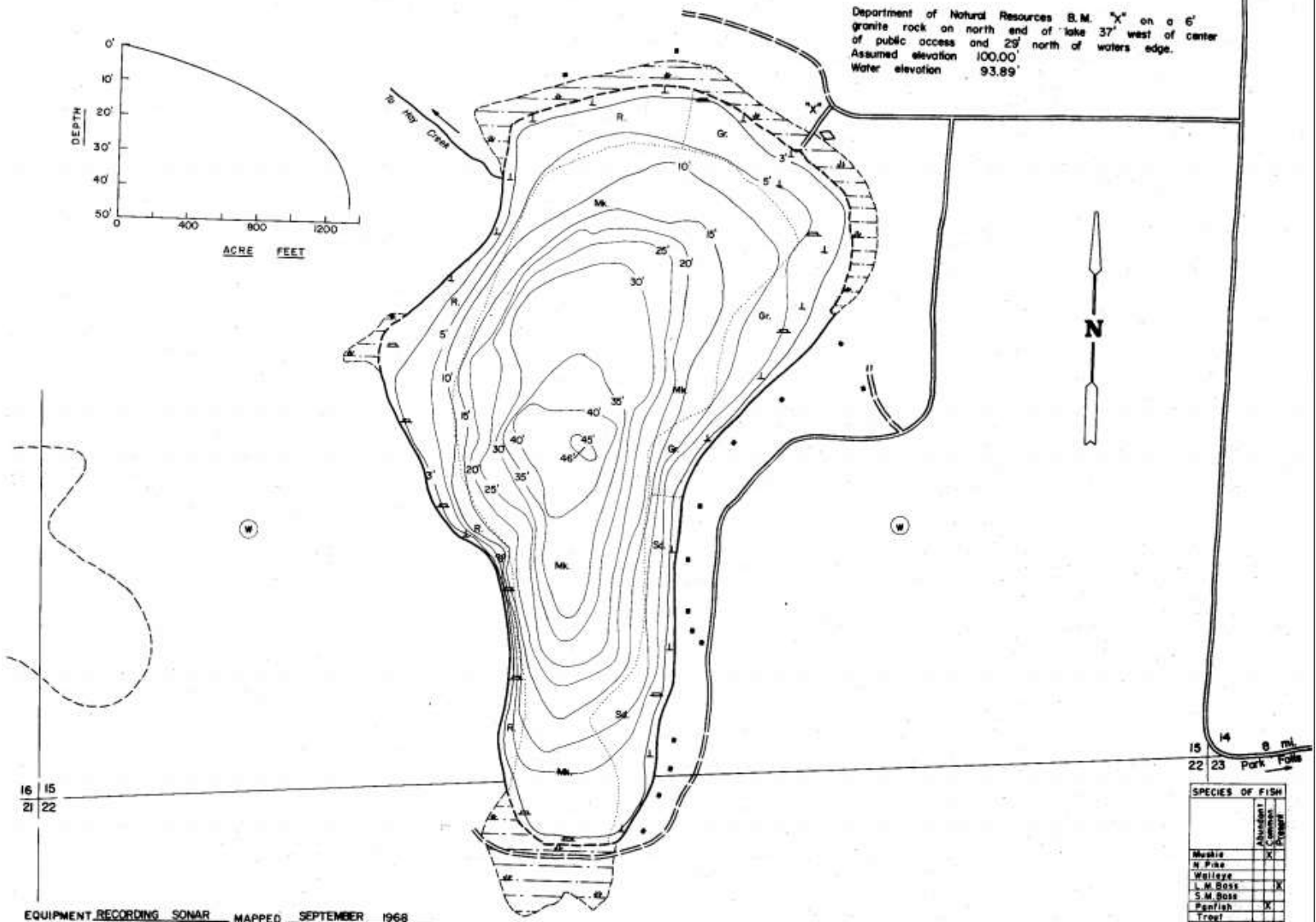
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

LAKE SURVEY MAP

BASS LAKE — PRICE COUNTY

SEC. 15 T. 40 N. R. 2 W.

Department of Natural Resources B.M. "X" on a 6" granite rock on north end of lake 37' west of center of public access and 29' north of waters edge.
Assumed elevation 100.00'
Water elevation 93.89'



SPECIES OF FISH	Abundant	Common	Present
Muskie		X	
N. Pike			
Walleye			
L.M. Bass			X
S.M. Bass			
Panfish		X	
Trout			

EQUIPMENT RECORDING SONAR MAPPED SEPTEMBER (MO.) 1968 (YR.)

WATER ELEV. 93.89'

TOPOGRAPHIC SYMBOLS
- (B) Brush
- (Pw) Partially wooded
- (W) Wooded
- (C) Cleared
- (P) Pastured
- (A) Agricultural
- B.M. Bench Mark
- Dwelling
- Resort
- Steep slope
- Indefinite shoreline
- Marsh
- Spring
- Intermittent stream
- Permanent inlet
- Permanent outlet
- Dam

LAKE BOTTOM SYMBOLS
- P. Peat
- Mk. Muck
- C. Clay
- M. Marl
- Sd. Sand
- St. Silt
- Gr. Gravel
- Stumps & Snags
- R. Rubble
- Br. Bedrock
- Submergent vegetation
- Emergent vegetation
- Floating vegetation

300' 0' 300' 600' 900' 1200' 1500'
SCALE

◇ Access ◆ Access with Parking ◆ Boat Livery

Field work by: C. Buech, C. Olson, J. Sather Drawn by: R. Ripp

AREA 84.30 ACRES
UNDER 3FT. 10.00 %
OVER 20FT. 33.5 %
VOLUME 1339.42 ACRE FT.
TOTAL ALK. 9 P.P.M.
SHORELINE 1.61 MILES
MAX. DEPTH 46 FEET